

# | SINA

The ASTM Group's  
engineering company



**SINA**

ASTM GROUP



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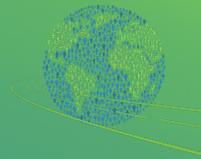
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# 1 | About SINA

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**SINA**, a design firm of the **ASTM Group**. The company has been a leading player for over fifty years in the conception, design, construction management of new projects in the fields of environment transportation, telecommunications, highways, railways, ports and maritime facilities. In 2017 SINA incorporated **SINECO**, a company belonging to the same Group, acquiring its know-how in the field of control engineering and maintenance of large transportation infrastructures, refined over thirty years of business.

**SINA** has developed criteria and methodological skills for the infrastructure projects throughout Italy, through environmental impact studies and construction compensation measures as well as monitoring and enhancement methodologies for the sites. In the field of civil works it stands out for being highly specialized in large-scale external and underground engineering works, integrated with important road and highways structures. Striving for the best technical and economic solutions, SINA's approach to design places particular emphasis on the aspects of maintenance and management of the projects to be carried out.





## ROADS AND HIGHWAYS

### “Infrastructure design”

We carry out design services, with different levels of detail, of new infrastructures, as well as the supervision of the construction and the testing of the assets, including the inspection and monitoring activities of existing assets in order to define their safety and implement corrective measures.



## AIRPORTS

### “Technology beyond horizons”

We provide services for assessing the safety of airside infrastructure by means of automated data collection instruments, as well as specialized activities for the implementation of effective computerized systems for the planned management of infrastructure maintenance.



## RAIL

### “Innovation by automation”

We provide automated monitoring services using state-of-the-art laser instrumentation to perform network geometric and topographic surveys, accessibility checks, and tunnel and structure inspections.



## PORTS

### “Works at sea”

Our maritime engineering and hydraulics services range from mathematical modeling of networks to the design of coastal and offshore assets, to environmental studies and related mitigation and compensation actions; we also deal with construction management and safety coordination during design and execution.



## OTHER

### “Our drive for excellence”

Innovative services in the areas of surveying and 3D modeling of infrastructures; specialized software for the management of infrastructure assets, such as bridges and tunnels, pavements and accidents; static and dynamic monitoring of structures; testing and laboratory tests on construction materials; research and development of new technologies for data processing and management, as well as leveraging deep learning technology.



## DESIGN AND CONSTRUCTION MANAGEMENT

We work on design solutions that guarantee the **SAFETY, FUNCTIONALITY** and **DURABILITY** of infrastructure, supervising their construction and first commissioning.

- Project Financing**
- Design**
- Construction Management**
- Security Coordination**
- Industrial Applications**
- Environmental Analysis and Design**



## ASSET MANAGEMENT

The Company has a highly specialized technical structure capable of carrying out management activities of infrastructure assets starting from the functional/structural audits of the assets.

- Asset audits scheduled**
- maintenance management**
- (Bridge, Tunnel e Pavement Management System)*
- Application software development**



## DIAGNOSTICS

The sector includes activities for the assessing the state of conservation of the assets and the planning of the maintenance of the infrastructure and its construction elements.

- Inspections**
- Material Testing Laboratory**
- Environmental and Instrumental Monitoring**
- Pavement Surveys**
- Laser and Topographic Surveys**
- Non-destructive Technologies**



## ROAD SAFETY

The Company performs specific studies aimed at maximizing the security of the infrastructure, incorporating human factors in the analysis and all other relevant aspects, and promotes safety through information and awareness campaigns.

- Safety Barriers**
- Road Safety Campaign**
- Tunnel safety**





## ITS

SINA has extensive experience in road and rail design as well as in the field of interconnection of transport systems (ITS Intelligent Transportation System) integrating telecommunications knowledge with engineering expertise.

## LASER

The company is a leader in the field of laser surveys, both static and dynamic, with cutting-edge technologies that allow the geometric-topographic acquisition of infrastructure and assets. Services for the design and inspection of the state of conservation of assets.

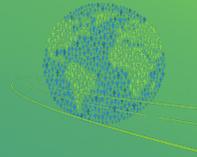
## RS

SINA, in its research and development activities, implements new technologies to improve the management of vehicle flows, driver information, road safety and transport efficiency, actively participating in specific national and international projects.

## BIM

In line with new market demands, SINA provides BIM services in every field of engineering and architecture, thus operating in an integrated way, drastically reducing design times, construction costs and optimizing the management of the works carried out.





# 2 | Roads and highways

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Modernization and enhancement of the Turin-Milan highway. One of the most noteworthy activities carried out by SINA in the last decade is the contribution offered in terms of design, construction management and safety coordination during the execution and design on several lots of the large-scale project for the modernization of the A4 Turin-Milan highway, consisting in the widening of both sides of the highway roads between Turin and Boffalora and the construction of a fourth lane between Boffalora and Milan. Specifically, the activities involved various lots amounting to a total project amount of 1,159,000,000.

The services also involved the crossing of the Ticino and Naviglio rivers in close proximity to the highspeed/high-capacity railway line, the construction of the new viaduct over the Sesia river, following the demolition of the existing one, and a crucial intervention on the Piedmont lot 1.4.1 (12.8 km), esteemed also for the high level of safety at the sites (from the protective Jersey barriers to the rockfall containment nets, from guardrails to the lifelines for stranded motorists).

**SERVICES**

- Definitive and Executive Planning
- Safety Coordination

**CUSTOMER**

- SATAP S.p.A.

**YEARS**

- 2014-2016





Noise barriers at the Cologno Monzese junction. The project involved the construction of a glazed artificial tunnel by means of a modular construction system. The system is composed of several elements, aimed at forming a sort of curved and shaped structure that runs parallel to the lanes in both directions.

Depending on the degree of noise absorption required, it takes the shape of simple curved barriers of varying height and real tunnels, some open and others covered that completely enclose the highway.

The triangular mesh structure is joined onto the final section with an artificial tunnel with a prefabricated twin-tube structure. The external surface of the tunnel is intended to be used as a green area, linking the two edges of the city and expanding of the existing park to the south.

The project is developed substantially within the boundaries of the existing highway route with some slight widening necessary, primarily to maintain the straightness of the structure and route.

**SERVICES**

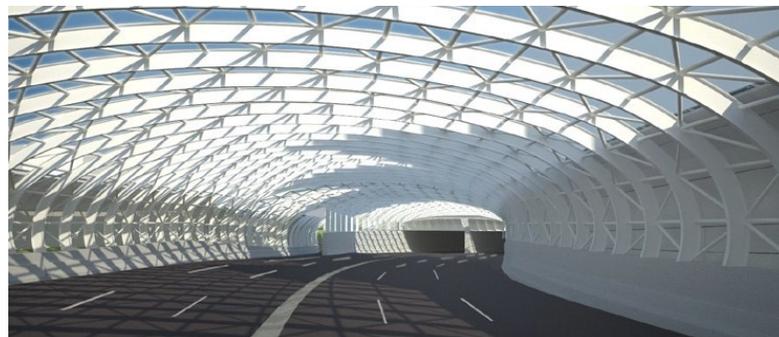
- Final Design

**CUSTOMER**

- Milano Serravalle S.p.A.

**YEARS**

- 2008-2011





The Milan East Outer Bypass (TEEM-A58) directly connects the A4 Turin-Trieste Highway, through the Agrate Brianza junction, with the A1 Milan-Bologna Highway, in the Municipality of Cerro al Lambro, amounting to a total length of 32.5 kilometers (specifically: 1.5 kilometers in the Province of Monza and Brianza, 23.8 kilometers in the Province of Milan and 7.2 kilometers in the Province of Lodi).

The highway has three lanes in each direction, plus an emergency lane, and uses the most modern technologies available to guarantee maximum safety for motorists as well as to reduce air and noise pollution.

The route of TEEM-A58 is interconnected with existing and planned highways (A1 Milan-Bologna, BreBeMi and A4 Turin-Trieste) and with the ordinary road network in the area, through junctions at Pessano con Bornago, Gessate, Pozzuolo Martesana, Liscate, Paullo and Vizzolo Predabissi.

**SERVICES**

- Final Design

**CUSTOMER**

- Milan East Outer Bypass - A58

**YEARS**

- 2009-2011





Survey of the highway network managed by the Brazilian license holder Ecorodovias with the aim of creating a 3D digital model to be used as a support for projects to upgrade the highway platform, maintenance and new projects.

Thanks to the tools used, namely the Lynx Mobile Mapper dynamic laser scanner, it was possible to survey about 2,200 km of highway in just 16 days of operation, acquiring over 1.5 TB of laser data and a database of 2,650,000 high-definition georeferenced images.

The technology enabled rapid georeferenced measurements by an Applanix POS LV420 positioning system, with accuracy comparable to topography, at a rate of over 400,000 points per second, resulting in high-density 3D laser point clouds of the infrastructure, including interchanges and highway assets.

**SERVICES**

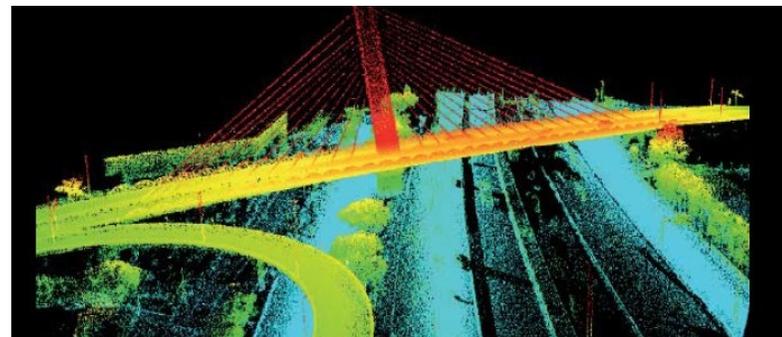
- Geometric Survey - Topographical survey of the roadway

**CUSTOMER**

- EcoRodovias Group

**YEAR**

- 2013





SINA, on behalf of Roma Capitale, has carried out the service of Surveillance and Monitoring of Road Infrastructure falling within the Expressway Network of Roma Capitale and in the Municipalities from Rome I to Rome XV. About 500 assets, including bridges, viaducts, tunnels and minor assets, have been placed under continuous monitoring with visual and instrumental inspections, engineering checks of static suitability, load tests and finite element modeling. In addition to surveillance and monitoring activities, the service included scheduling maintenance of the most important assets including bridges, tunnels and overpasses.

These activities were carried out using equipment for structural tests and investigations (static load tests, dynamic load tests, topographical surveys, etc.) and with modern TLS technologies (Terrestrial Laser Scanner).

Finally, the application of specific BMS (Bridge Management System) software has allowed the collection and computerized systematization of inspection and control data necessary for the implementation of planned and unplanned maintenance programs of the assets.

**SERVICES**

- Surveillance and Monitoring Service of the Highways Network of Roma Capitale - Lot 3 assets

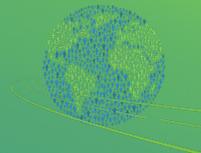
**CUSTOMER**

- Roma Capitale

**YEARS**

- 2019-2020





# 3 | Airports

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On behalf of ADR Engineering, SINA carried out a campaign of highperformance surveys aimed at analyzing surface deterioration and evaluating the functional and structural characteristics of the pavements of the aircraft infrastructure at Rome Fiumicino Airport.

The survey was performed with several high-performance instruments including: the Heavy Weight Deflectometer (HWD), Automatic Road Analyzer (ARAN), Ground Penetrating Radar (GPR), and Laser Road Imaging System (LRIS). The data processing made it possible to determine a series of indicators for every asset: the PCN (Pavement Classification Number) bearing capacity index, the IRI (International Roughness Index), which represents the international reference standard to define longitudinal regularity, the rutting index (RUT) for crosswise regularity and, finally, the PCI (Pavement Condition Index) to define the state of surface deterioration.

Finally, the assignment included the computerization of the data and the supply of software for the visualization of the geo-referenced digital images related to the pavement surface.



## SERVICES

- Evaluation of pavement condition indicators



## CUSTOMER

- ADR Engineering S.p.A.



## YEARS

- 2008-2009



# SINA | Orio al Serio Airport

AIRPORTS



The service consisted of a series of specialized investigations aimed at defining a real and advanced Pavement Management System, based on a detailed snapshot of the structural and functional state of the pavements of the aircraft infrastructure.

The Airport Manager has thus been able to acquire detailed information on the actual state of the pavements, as well as an “Airport Pavement Management System” software, which is capable of assessing the decay over time of the various characteristic parameters of the pavements (PCN, IRI, MPD, etc.), the most suitable types of maintenance operations, all accompanied by effective graphic displays and color mapping.

State-of-the-art tools including the Heavy Weight Deflectometer (HWD), Automatic Road Analyzer (ARAN), Laser Road Imaging System (LRIS) and Georadar were used to survey the data.



## SERVICES

- Evaluation of pavement condition indicators



## CUSTOMER

- SATAP S.p.A.



## YEAR

- 2013





SINA conducted a deflectometric survey in 2018 on the NaplesCapodichino airport site on the load-bearing capacity of pavements, performed with HWD (Heavy Weight Deflectometer) tool, which is also particularly significant in terms of its extension. In particular, the analysis, which was carried out by means of a survey with a step of about 50 m, concerned the RWY 06/24 runway, the Echo, Foxtrot and Hotel junctions, the TN and TS taxiways, the Mike junction, the aprons and a service road.

The calculation of the elastic modules of the pavement was performed through the use of a specific application software that allows the modeling of the superstructure as an elastic and isotropic multilayer of semi-infinite thickness.

The survey thus made it possible to verify the actual load-bearing conditions of the pavements, by checking the ACN/PCN values defined by ICAO annex 14, and to identify the areas to be subjected to structural upgrading interventions.



### SERVICES

- Evaluation of pavement condition indicators



### CUSTOMER

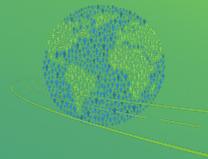
- Gestione Servizi Aeroporto Capodichino S.p.A.



### YEAR

- 2018





# 4 | Rail

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# High-Speed High-Capacity Turin-Milan Railway Line



On behalf of the Consorzio Alta Velocità Torino-Milano (C.A.V.To.Mi) , construction management and safety coordination activities were carried out for the civil and plant engineering works of the construction lot for the Turin-Novara section and the Novara-Milan section.

Specifically, the services included the supervision and control of the construction, accounting, testing assistance, verification of the conformity of the materials used with inspections at the production plants and, finally, the drafting and validation of As-Built projects.

The engineering activity described above involved the execution of civil works, both on and off the line, i.e., railway embankments, infrastructure assets, new roads and upgrading of the existing road network, as well as buildings and water operations.

While, as regards the plant engineering responsibilities, the services carried out concerned the track equipment and the electrical traction system, signaling, telecommunications, lighting and motive power systems.

**SERVICES**

- Construction Management, Safety Coordination and Testing Assistance

**CUSTOMER**

- Turin-Milan High Speed Consortium C.A.V.To.Mi

**YEARS**

- 2004-2014





SINA, on behalf of the subsidiary Itinera, carried out the execution design of the construction comprising Lot 2 of the railway connection between Terminal 1 and Terminal 2 of the intercontinental airport of Milan Malpensa City of Milan (double track railway connection of 3.4 km), within the municipality of Somma Lombardo (Varese).

In particular, the line and road works and the line and station electrical systems were designed as follows:

- Construction of electrical traction system for the entire section under construction and of the new Terminal 2 station;
- Signaling systems with the construction of new ACEI systems in the Malpensa Terminal 1 and Malpensa Terminal 2 stations and modifications to line PBAs 315A and 315B;
- Line and station telecommunications systems, including the renewal of all existing equipment requiring implementation/replacement and emergency equipment.

The contract also included the execution design of the track systems, with the construction of approximately 3,250 meters of double track and approximately 920 meters for the two priority tracks in the new Terminal 2 station

 SERVICES

- Execution Design

 CUSTOMER

- Itinera S.p.A.

 YEARS

- 2014-2016





On behalf of Società Metropolitana di Napoli S.p.A., a survey was carried out of the Ponte della Bettina tunnel on the Circumvesuviana line, CDNCapodichino section, by means of Tunnel Scanner System technology.

The Tunnel Scanner System is an automatic survey system based on the simultaneous use of infrared rays and laser that makes it possible to obtain a complete photographic and thermographic image of the interior of the tunnel (facing, vault and platform) and to simultaneously acquire all the data necessary for the geometric survey of the crosssections at any point of the tunnel.

The photographic image of the interior of the tunnel was taken at a resolution of 10,000 pixels/ revolution, a resolution that made it possible to view every detail, both of the coating and of the installed services, with high detail.

The infrared thermographic survey was carried out at the same time as the visual and geometric survey, and as a result it was then possible to detect the defects on the coating due to washouts, water flows, etc.

 **SERVICES**

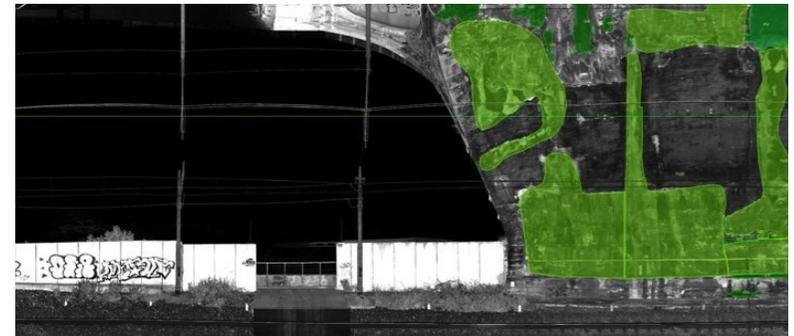
- Survey with TSS - Tunnel Scanner System

 **CUSTOMER**

- Metropolitana di Napoli S.p.A.

 **YEAR**

- 2019





# 5 | Ports

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The Port Authority of Trieste had identified and implemented in the three-year operational plan the expansion of the port areas with a series of interventions, the most important of which was the project of the Logistic Platform between Scalo Legnami and the former Italsider area.

The project consisted in making a total area of about 250,000 square meters available for shipping, and approximately 150,000 meters were obtained from an area occupied by the sea, artificially straightening the existing coastline.

The planned infrastructure also provided for: the hanging quay of the whole area now occupied by the sea with depth greater than 2.5 m and its confinement for use as reclaimed land, the infrastructure of new road and railway connections, the construction of a suitable system of surface and underground water disposal with related purification plants, the construction of suitable electrical, water and fire-safety systems, the construction of port warehouses and suitable quay cranes.

**SERVICES**

- Preliminary design of the logistics platform to be built between Scalo Legnami and the former Italsider Area

**CUSTOMER**

- Trieste Port Authority

**YEAR**

- 2013





The Taranto Logistic Platform Project was part of the projects approved by CIPE and included in the three-year planning of the Taranto Port Authority as Preliminary and final design of the maritime defense works and dredging involved in the new first phase of implementation of the European platform including the environmental impact study and the environmental impact assessment.

The aim of the intervention was to provide the port of Taranto with a port infrastructure in line with the guidance of the General Transport Plan and the project concerned the improvement of structures, technology and service equipment within the Port of Taranto.

The final and execution design of the intervention has been developed for the following areas: logistics platform on the former RFI ' elevation area, widening of the IV protrusion, dock west of the IV protrusion and adaptation and strengthening of the Strada dei Moli.

**SERVICES**

- Taranto Port Platform - Design, Safety Coordination in the Design Phase and Environmental Impact Study

**CUSTOMER**

- Taranto Port Authority

**YEARS**

- 2009-2010





The preliminary and final project for the area of the Large Tanker and Energy Dock of the Port of Civitavecchia has been developed taking into account the needs of a port market in strong growth. The plan is comprised of the relocation of the line of the quay towards the sea and a modification to the point of anchorage of the breakwater in order to guarantee two berths for ships up to 400 meters and a turning circle of about 650 m compatible with these carriers.

The intervention consisted in the overall reduction of the docked fronts that passed from a total length of about 2020 m to about 1710 m. The reduction in terms of number of berths and overall length has allowed the optimization and the possibility of mooring for new generation carriers, while for the oil sector a berth has been located on the breakwater for ships and barges.

The interventions for the intake and return works at the service of the Tirreno Power plant were optimized by bringing the intake to a shallower seabed and structuring the return within pipes that cross the dock keeping below the project depth of -18 m, with outlet outside the breakwater.

**SERVICES**

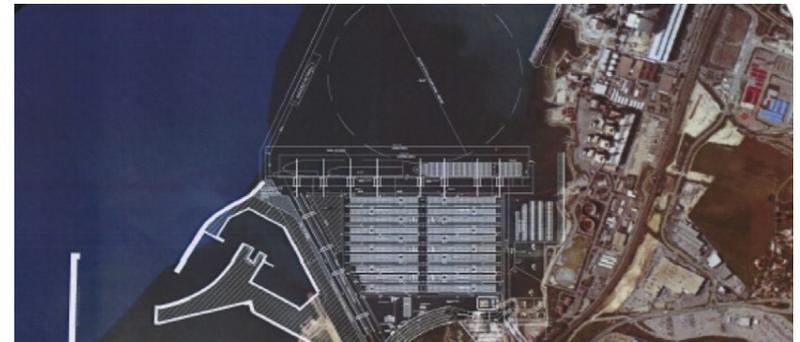
- Preliminary and Final Design. Technical and functional renewal of the Large Tanker and Energy Dock

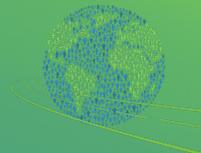
**CUSTOMER**

- Port Authority of Civitavecchia

**YEARS**

- 2014-2015





# 6 | Other

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OTHER

Technical expertise and high technology at the service of infrastructure asset management are the basic elements of the Bridge Management System (BMS) developed and implemented by SINA. The continuous evolution of technologies has in fact changed the concept of maintenance from a series of repairs to a complex management system aimed at preventing deterioration of the works and upgrading them to comply with regulatory standards.

A significant response to the current maintenance needs expressed by the Managers is precisely the exclusive methodology, concerning inspection and control activities, developed by SINA and called SIOS (Sistema Ispettivo Opere Sina/Sina Asset Inspection System), whose purpose is to assess the conservation and safety of the structures and quantify the state of deterioration.

Recent national regulations requiring seismic vulnerability analyses of strategic structures have also necessitated the development of an additional specific methodology integrated into SIOS.



## SERVICES

- Ingegneria - Ispezione opere e software



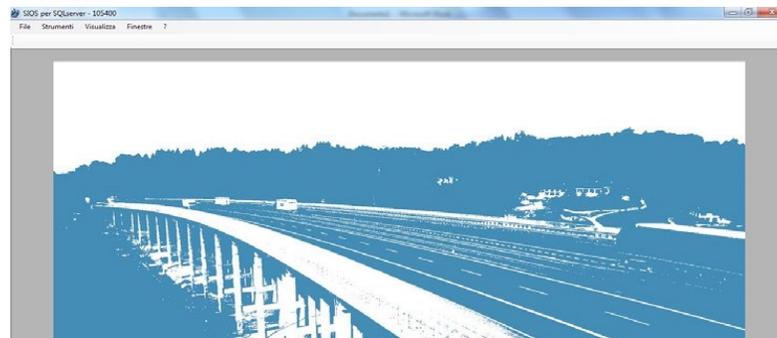
## CUSTOMER

- Società autostradali Gruppo ASTM



## YEARS

- 2012 - in corso





# Misano Adriatico Circuit



OTHER

The company Santa Monica S.p.A., owner of Misano World Circuit, carried out the survey activities of surface adhesion parameters through the use of SINA technologies. (Transverse Adhesion Coefficient), macro-texture sand patch testing (Height in Sand) and the survey of surface regularity characteristics (International Roughness Index) of the racetrack pavement.

The S.C.R.I.M.-TEX (Sideway force Coefficient Routine Investigation Machine and TEXture Meter) equipment was used to monitor the above parameters.

The survey was carried out at variable speed, according to the geometric characteristics of the track, with a sampling step of 10 meters and in relation to the right and left wheel paths on which the passage of vehicles is concentrated.

The results made it possible to check, in a quick and precise manner, the flatness of the paved surface and the regular adhesion conditions.

## SERVICES

- High-yield survey operation to evaluate the functional characteristics of the Marco Simoncelli racetrack pavements

## CUSTOMER

- Santa Monica S.p.A.

## YEARS

- 2018-2019





On behalf of the Municipality of Milan, a service has been carried out for the creation of a digital model of the main squares of Milan where events are held.

The survey, carried out by laser scanner, was comprised of a total of twenty-five squares, including Piazza Duomo, Piazza Sempione, Arco della Pace, Piazzale Cadorna, Piazzale Cordusio, etc. A 3D digital model of each was built using GIS technology useful for the planning of events to be held in the City of Milan in the coming years.

Smart City, urban planning and security, a set of strategies aimed at optimizing and innovating public services so as to relate the infrastructure of cities with the human, intellectual and social capital of those who live there.

All this has been the result of the widespread use of new technologies and SINA as their constant promoter.



### SERVICES

- Creation of a 3D Digital Model of the main squares of Milan



### CUSTOMER

- Metropolitan City of Milan



### YEARS

- 2018-2019



*#movingtothefuture*



**SINA**  
ASTM GROUP